



# 8WH20LC2176-1 Marine propulsion engine



## Basic engine specifications

Rating .....	P1
Rated power-kW .....	1600
Rated speed-rpm .....	1000
Overload power-kW .....	1760
Overload speed-rpm .....	1032
Rated power tolerance-% .....	3
Low idle speed-rpm .....	400
High idle speed-rpm .....	1050
N° of Cylinders / Valves .....	8/32
Cylinders arrangement .....	In-line
Thermodynamic cycle .....	4 stroke
Bore × Stroke-mm(in) .....	200×300 (7.87×11.81)
Compression ratio .....	15:1
Displacement-L(in <sup>3</sup> ) .....	74.39 (4539.56)
Fuel system .....	Mechanical monomer pump
Injection system .....	Direct injection
Aspiration .....	Turbocharged and aftercooled
N° of teeth on flywheel ring gear .....	224
Firing order .....	1-3-7-4-8-6-2-5
Rotation(from flywheel end) .....	Clockwise
Overall dimensions(L×W×H)-mm(in) .....	4132×1365×2642 (163×54×104)
Dry weight-kg(lb) .....	11800 (26015)
Max. output power of front end-kW(Ps) .....	300 (408)
Max. output torque of front end-N·m(ft-lbs) .....	2865 (2114)
Emission compliance .....	IMO Tier II

## Rating definitions

### Continuous Duty (P1)

The engine can run at full load continuously. The average load factor is 70% to 100%. Annual working time is recommended but not limited to 5000h~8000h.

### Heavy Duty (P2)

The engine can run at full load for 8h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 5000h.

### Intermittent Duty (P3)

The engine can run at full load for 4h every 12h. The average load factor is 40% to 80%. Annual working time is recommended but not limited to 3000h

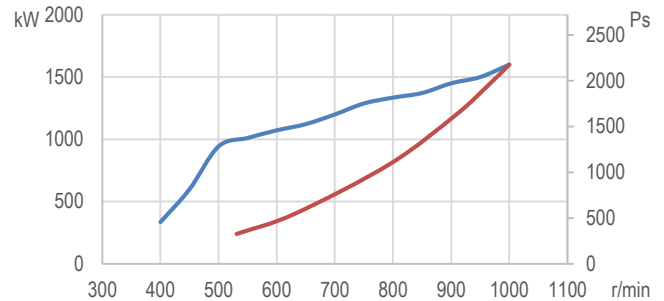
### Light Duty (P4)

The engine can run at full load for 2h every 8h. The average load factor is about 60%. Annual working time is recommended but not limited to 1000h.

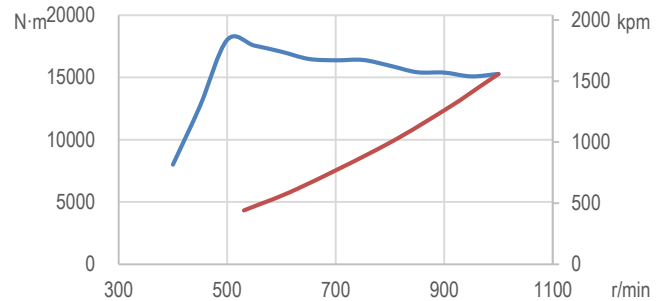
### High Performance Duty (P5)

The engine can run at full load for 0.5h every 5h. The average load factor is about 60%. Annual working time is recommended but not limited to 500h.

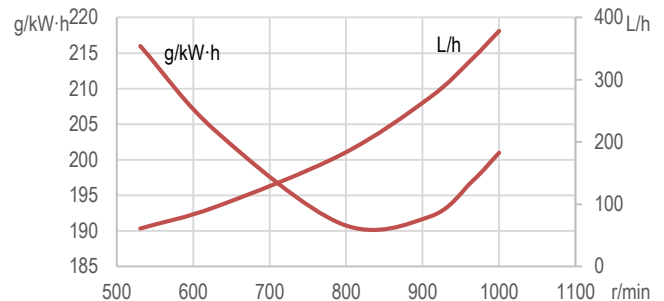
## Power



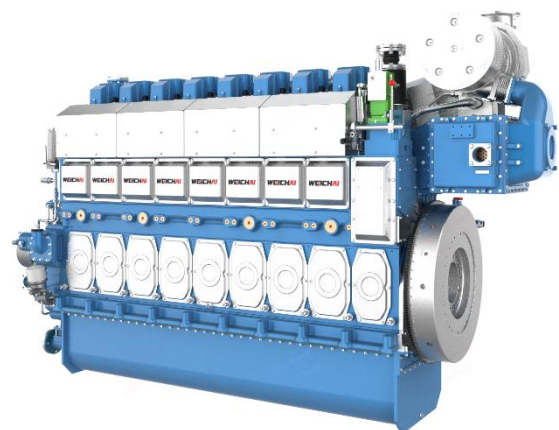
## Torque



## Fuel consumption



— Full load speed characteristics  
— Propeller characteristics





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## Air intake system

Intake air flow-m <sup>3</sup> /min(cfm)	204 (7204)
Max. allowable intake air restriction-kPa(in H <sub>2</sub> O)	2.5 (10)
Intake air temperature up to-°C(°F)	60 (140)

## Cooling system

Max. sea water strainer mesh hole diameter-mm(in)	2 (0.08)
Sea water pump flow-m <sup>3</sup> /h(gal/min)	57 (209)
Head of sea water pump-m(ft)	36 (118)
Coolant capacity of the engine-L(gal)	112 (24.6)
Fresh water pump flow-m <sup>3</sup> /h(gal/min)	43 (158)
Head of fresh water pump-m(ft)	36 (118)
Min. pressure at fresh water pump inlet-kPa(in H <sub>2</sub> O)	20 (80)
Temperature range of thermostat-°C(°F)	77~87 (171~189)
Heat dissipating of cooling system-kW(BTU/min)	1040 (59145)

## Exhaust system

Exhaust flow-kg/h(lb/h)	15838 (34916)
Max. exhaust back pressure-kPa(in H <sub>2</sub> O)	3 (12)
Max. exhaust temperature before turbocharger-°C(°F)	600 (1112)
Exhaust smoke-FSN	≤1.0

## Lubricating system

Max. install angle(fore-aft)	5°
Max. install angle(athwart ship)	15°
Max. operating angle(fore-aft)	7.5°
Max. operating angle(athwart ship)	22.5°
Sump type	Wet
Oil capacity Low/High-L(gal)	340/460 (74.8/101.2)
Oil consumption-g/kW·h	0.5
Oil flow-L/min(gal/min)	1083 (238)

## Fuel system

Fuel flow supply line-L/h(gal/h)	1400 (308)
Fuel flow return line-L/h(gal/h)	1021 (225)
Min. Allowable fuel pressure of engine inlet-kPa(in H <sub>2</sub> O)	17 (68)
Max. fuel return restriction-kPa(in H <sub>2</sub> O)	34 (137)
Max. fuel inlet temperature-°C(°F)	45 (113)

## Starting system

Electrical system voltage(2-pole)-V	24
Electric starter power-kW(Ps)	31 (42)
Recommended battery capacity(5°C and above)-A.h	450
Recommended battery capacity(-5°C and above)-A.h	500
Air starter power-kW(Ps)	40 (54)
Min. pressure of air starter-MPa	1.0
Air consumed per start-Nm <sup>3</sup>	500

## Security parameters

Alarm speed-rpm	1100
Shut down speed-rpm	1150
Alarm oil pressure-MPa	0.2
Shut down oil pressure-MPa	0.15
Alarm oil temperature-°C(°F)	78(172)
Alarm coolant temperature-°C(°F)	88(190)

## Noise

Noise(LwA)-dB(A)	124
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## General remarks

- The origin of coordinates is at the center of the flywheel housing back end surface. X axis directs from flywheel to front, Z axis directs vertical up, Y axis direction is defined by right-hand rule.
- All ratings are based on operating conditions under ISO 8665, ISO 3046-1.
- Curves represent net engine performance in accordance with ISO 3046/1 with standard accessories such as fuel injection pump, water pump and L.O. pump under the condition of 25°C/77°F ambient temperature, 100kPa[29.612 in Hg] barometric pressure, 30% relative humidity and 25°C/77°F raw water temperature at inlet.

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Materials and specifications are subject to change without notice.